What is claimed:

1. An osmolarity measuring system, comprising:

a sample receiving chip, the sample receiving chip comprising a sample region that includes a plurality of electrodes, the sample region configured to receive an aliquot of fluid; and

a processing device coupled with the sample receiving chip, the processing device configured to measure the intrinsic conductivity for each of the plurality of electrodes, determine electrical properties for the aliquot of fluid based on signals applied to and received from the plurality of electrodes, and to calibrate the determined electrical properties using the measured intrinsic conductivities.

2. The osmolarity measuring system of claim 1, wherein the processing device is further configured to store the measured intrinsic conductivity for each of the plurality of electrodes.

3. The osmolarity measuring system of claim 1, wherein the sample receiving chip comprises two conductive leads per electrode, and wherein the processing device is configured to determine the intrinsic conductivity for each of the plurality of electrodes by applying signals to the two associated conductive leads.

4. The osmolarity measuring system of claim 3, wherein measuring the intrinsic conductivity comprises applying an AC or DC current to each of the plurality of electrodes via the two conductive leads

associated with each of the plurality of electrodes, measuring the resulting voltage across the two leads, and determining an intrinsic resistance for each of the plurality of electrodes based on the measured voltage.

5. The osmolarity measuring system of claim 3, wherein measuring the intrinsic conductivity comprises applying a time domain signal to each of the plurality of electrodes via the two conductive leads associated with each of the plurality of electrodes, receiving a resulting output for each of the plurality of electrodes, transforming the resulting output into a map of amplitude versus frequency of the output signal over a range of frequencies, and using the map to determine the intrinsic conductivity for each of the plurality of electrodes over the range of frequencies.

6. The osmolarity measuring system of claim 3, wherein calibrating the determined electrical properties using the measured intrinsic conductivities comprises subtracting the intrinsic conductivity for a relevant pair of electrodes from the determined electrical properties.

7. The osmolarity measuring system of claim 3, wherein the processing device is further configured to generate a calibration curve based on the measured intrinsic conductivities for each of the plurality of electrodes and to use the calibration curve to calibrate the determined electrical properties.

8. An osmolarity measuring system, comprising:

a sample receiving chip, the sample receiving chip comprising a sample region that includes a plurality of electrodes, the sample region configured to receive an aliquot of fluid and a certain amount of a standard test fluid; and

a processing device coupled with the sample receiving chip, the processing device configured to determine a pair-wise calibration factor for the plurality of electrodes based on signals applied to and received from the plurality of electrodes when the standard test fluid is applied to the sample region, determine electrical properties for the aliquot of fluid based on signals applied to and received from the plurality of electrodes when the aliquot of fluid is applied to the sample region, and to calibrate the determined electrical properties using the pair wise calibration factor determined for the plurality of electrodes.

9. The osmolarity measuring system of claim 8, wherein each pair wise calibration factor is determined from a calibration curve generated for each of pair of electrodes in the plurality of electrodes.

10. The osmolarity measuring system of claim 9, wherein the processing device is further configured to determine a lower end of the calibration curves once the standard test fluid is applied to the sample region by applying a test signal to the plurality of electrodes, receiving responses to the test signal from the plurality of electrodes, and determining the electrical properties for the standard test based on the received responses.

11. The osmolarity measuring system of claim 10, wherein an upper end of the calibration curves based on defined electrical properties.

12. The osmolarity measuring system of claim 11, wherein each of the calibration curves is normalized based on the volume of standard test fluid per electrode pair.

13. The osmolarity measuring system of claim 8, wherein the standard test fluid comprises a low salt content.

14. The osmolarity measuring system of claim 8, wherein the standard test fluid is de-ionized water.

15. The osmolarity measuring system of claim 8, wherein the standard test fluid comprises a relatively high salt concentration, and wherein the processing device is further configured to account for slat crystals formed on the plurality of electrodes when the standard test fluid is applied to the plurality of electrodes.

16. The osmolarity measuring system of claim 15, wherein accounting for the salt crystals comprises directly adjusting the concentration of salt in an aliquot of fluid once the aliquot of fluid is placed on the sample region.

17. The osmolarity measuring system of claim 16, wherein directly adjusting the concentration of salt in an aliquot of fluid comprises determining a response curve for each pair of electrodes once the aliquot

of fluid is placed on the sample region, integrating the response curves for each pair of electrodes estimating the amount of salt solution added to the aliquot of fluid as a result of the salt crystals, and adjusting the salt concentration for the aliquot of fluid based on the estimated amount of salt added by the salt crystals.

18. The osmolarity measuring system of claim 8, further comprising a micro fluidic chamber configured to provide a steady stream of fluid flow across the sample region in order to remove the standard test fluid from the sample region after the standard test fluid has been applied to the sample region.

19. The osmolarity measuring system of claim 8, further comprising an air supply configured to supply an air stream to the sample region in order to remove the standard test fluid from the sample region after the standard test fluid has been applied to the sample region.

20. The osmolarity measuring system of claim 8, wherein the processing device is further configured to measure the intrinsic conductivity for each of the plurality of electrodes, determine electrical properties for the aliquot of fluid based on signals applied to and received from the plurality of electrodes, and to calibrate the determined electrical properties using the measured intrinsic conductivities.

21. The osmolarity measuring system of claim 20, wherein the processing device is further configured to store the measured intrinsic conductivity for each of the plurality of electrodes.

22. The osmolarity measuring system of claim 20, wherein the sample receiving chip comprises two conductive leads per electrode, and wherein the processing device is configured to determine the intrinsic conductivity for each of the plurality of electrodes by applying signals to the two associated conductive leads.

23. The osmolarity measuring system of claim 22, wherein measuring the intrinsic conductivity comprises applying an AC or DC current to each of the plurality of electrodes via the two conductive leads associated with each of the plurality of electrodes, measuring the resulting voltage across the two leads, and determining an intrinsic resistance for each of the plurality of electrodes based on the measured voltage.

24. The osmolarity measuring system of claim 22, wherein measuring the intrinsic conductivity comprises applying a time domain signal to each of the plurality of electrodes via the two conductive leads associated with each of the plurality of electrodes, receiving a resulting output for each of the plurality of electrodes, transforming the resulting output into a map of amplitude versus frequency of the output signal over a range of frequencies, and using the map to determine the intrinsic

conductivity for each of the plurality of electrodes over the range of frequencies.

25. The osmolarity measuring system of claim 22, wherein calibrating the determined electrical properties using the measured intrinsic conductivities comprises subtracting the intrinsic conductivity for a relevant pair of electrodes from the determined electrical properties.

26. The osmolarity measuring system of claim 22, wherein the processing device is further configured to generate a calibration curve based on the measured intrinsic conductivities for each of the plurality of electrodes and to use the calibration curve to calibrate the determined electrical properties.